

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated December 5, 2007 has been received and its contents carefully reviewed.

Claims 1, 2, 5-8, 15-18, 20, and 21 are rejected by the Examiner. With this response, claims 1, 2, 6, 7, 15, 18, and 21 are hereby amended. No new matter has been added. Claims 1, 2, 5-8, 15-18, 20 and 21 remain pending in this application.

In the Office Action, claims 1, 2, 5-8, 15-18, 20, and 21 are rejected on the ground of non-statutory double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,788,280. Claims 1, 2, 6-8, and 16-18 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,320,562 to Ueno et al. (hereinafter "Ueno"). Claims 5, 15, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ueno. Claim 21 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ueno in view of Johnson (WO 99/05567).

The rejection of claims 1, 2, 6-8, and 16-18 under 35 U.S.C. § 102(e) as being anticipated by Ueno is respectfully traversed and reconsideration is requested. Applicant submits that Ueno does not disclose either explicitly or inherently each and every element recited in these claims of the present application.

Independent claim 1 recites a method of driving a liquid crystal display having a combination of features including: "receiving and registering first source data for display by a liquid crystal cell of a liquid crystal panel during a first frame period; receiving second source data for display by the liquid crystal cell during a second frame period subsequent to the first frame period; [and] generating modulated data according to a comparison result between the registered first source data and the second source data." Applicant submits that Ueno does not disclose at least the above quoted features of claim 1.

In rejecting claim 1, the Examiner identifies the compensation data 501 disclosed in Ueno as the generated "modulated data". See page 4 of the Office Action. Applicant respectfully submits that Ueno does not disclose that the compensation data is generated "according to a comparison result between the registered first source data" and the second source data" where the registered first source data is "for display by a liquid crystal cell of a liquid crystal panel

during a first frame period” and where the second source data is “for display by the liquid crystal cell during a second frame period subsequent to the first frame period” as recited in claim 1.

Regarding the generation of compensated data, Ueno discloses the following (emphasis added):

“First, a desired compensation value in a predetermined period is obtained using the line memory A 51, LUT 52, the adder 53, and the line memory B 54. The line memory A 51 and the LUT 52 output a square value V_i^2 of a compensation amount corresponding to a change in arithmetic data between two adjacent horizontal scanning periods. First, arithmetic data S401 which is output from the orthogonal transformation circuit 4 is input to the line memory A 51, and maintained for one horizontal scanning period. Sequentially input arithmetic data S401 and arithmetic data S510 (from one horizontal scanning period before, which is held at the line memory A 51), are input to the LUT 52. Next, square value S520 of a compensation amount based on a previously-provided loss-and-gain table of RMS voltage levels is output to the adder 53.

Further as shown in Fig. 2B of Ueno, a frame period consists of a plurality of horizontal scanning periods, and the compensation data is applied between pairs of adjacent horizontal scanning periods. That is, Ueno discloses calculating a compensation amount “corresponding to a change in arithmetic data between two adjacent horizontal scanning periods.” Still further, as may be appreciated from Fig. 2B of Ueno, data from adjacent horizontal periods in Ueno is not data for display by the same liquid crystal cell. For example, Fig. 2B of Ueno shows that during a first horizontal period, data is output for display lines 9-12, and that during the adjacent horizontal period data in the same frame is output for lines 13-16 with a compensation processing period interposed. Accordingly, the compensated values disclosed in Ueno are not generated from a comparison between “first source data for a liquid crystal cell of a liquid crystal panel for display during a first frame period” and “second source data for the liquid crystal cell for display during a second frame period subsequent to the first frame period.” Applicant submits that Ueno does not anticipate claim 1 for at least this reason.

Ueno states the following concerning the compensation data at column 13, lines 50-55:

“During a period when the compensation voltages are being applied to the column electrodes, all of the row drivers apply a voltage at the time when the row electrodes are not selected to the row electrodes. Specifically, all of the row drivers do not output a selection pulse during the period when compensation voltages are applied to the column electrodes.”

In other words, during the time of application of the compensation voltage to the column electrodes, the selection pulses are not applied to transfer the compensation voltage to a liquid crystal cell, and accordingly the compensation voltage is not applied to the pixel electrode of the liquid crystal cell. Accordingly, Applicant submits that Ueno does not disclose at least, “supplying the modulated data to the pixel electrode of the liquid crystal cell of a liquid crystal panel during an initial portion of an output period; and applying data different from the modulated data to the pixel electrode of the liquid crystal cell of the liquid crystal panel at a later portion of the output period than the initial portion.” Applicant respectfully submits that Ueno does not anticipate claim 1 for at least this additional reason.

Independent claim 7 recites an apparatus for driving a liquid crystal display having a combination of features including “a modulator that receives and registers first source data for display by liquid crystal cells of a liquid crystal panel during a first frame period, receives second source data for display by the liquid crystal cells during a second frame period subsequent to the first frame period, and that generates modulated data for each of the liquid crystal cells according to a comparison result between the registered first source data corresponding to the respective liquid crystal cell and the second source data corresponding to the respective liquid crystal cells” and “a data provider alternately applying the modulated data and data different from the modulated data to a pixel electrode of each of the liquid crystal cells of the liquid crystal panel.” The Examiner rejects claim 7 using the same rationale given for claim 1. Applicant submits that Ueno does not disclose at least the quoted features recited in claim 7, for at least the reasons given for claim 1, and that accordingly Ueno does not anticipate claim 7.

Further, Applicant submits that Ueno does not disclose “a data provider alternately applying the modulated data and data different from the modulated data to a pixel electrode of each of the liquid crystal cells of the liquid crystal panel.” In particular, in the timing diagram of Fig. 2B of Ueno, the compensation voltage is not alternated with another voltage at each cell of the display, but is applied only after applying several output data (d0-d3) to the display. There is no disclosure in Ueno to have compensation periods applied for each output of data for a group of lines of display. Applicant submits that Ueno does not anticipate claim 7, for at least this additional reason.

Applicant notes that claims 2, 6, 8, 16, and 17 depend respectively from claims 1 and 7 and each includes, by reference, all of the elements of their respective base claims. Accordingly, Applicant submits that Ueno does not anticipate claims 2, 6, 8, 16, and 17 at least by way of the dependencies of the claims, and for the reasons given above for their respective base claims 1, and 7.

Independent claim 18 recites a liquid crystal display including a modulator and data adapter having a similar combination of features to those discussed above for claim 7. The Examiner rejects claim 18 using essentially the same rationale given for claim 7. Applicant submits Ueno does not disclose at least “a data provider alternately applying the modulated source data and the second source data to liquid crystal cells of the liquid crystal panel through the data lines during a frame period” as recited in claim 18 for the reasons given above for claim 7. Accordingly, Applicant respectfully submits that Ueno does not anticipate claim 18.

The rejection of claims 5, 15, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Ueno is respectfully traversed and reconsideration is requested.

Applicant notes that claims 5, 15, and 20 depend respectively from claims 1, 7, and 18 and that each includes by reference all of the limitations of the respective base claims.

As Applicant has discussed above, Ueno does not anticipate claims 5, 15, and 20. In rejecting claims 5, 15, and 20, the Examiner makes remarks intended to cure the deficiencies of Ueno with respect to features explicitly in claims 5, 15, and 20. Applicant submits that the Examiner’s remarks do not address or cure the deficiencies of Ueno with respect to claims 1, 7, and 18 as discussed above. Accordingly, Applicant submits that claims 5, 15, and 20 are each allowable over Ueno at least by way of their respective dependencies from claims 1, 7, and 18.

The rejection of claim 21 under 35 U.S.C. § 103(a) as being unpatentable over Ueno in view of Johnson is respectfully traversed and reconsideration is requested.

Claim 21 recites a method of driving a liquid crystal display having a combination of features including for example, “applying a modulated data signal to pixel electrodes of each of liquid crystal cells of a liquid crystal panel within one frame period” and “wherein the modulated data signal is generated for each of the liquid crystal cells according to a comparison result between data for the respective liquid crystal cell from a frame period previous to the one frame period and data for the respective liquid crystal cell from the one frame period.”

Applicant submits that Ueno does not teach or suggest at least “applying a modulated data signal to the pixel electrodes of liquid crystal cells of a liquid crystal panel” because as discussed above, Ueno discloses regarding the compensation voltage that “the row drivers do not output a selection pulse during the period when compensation voltages are applied to the column electrodes.” Accordingly, the compensation voltages of Ueno are not applied to the pixel electrodes.

Further, for the reasons discussed above with regards to claim 1, Ueno does not teach or suggest “wherein the modulated data signal is generated for each of the liquid crystal cells according to a comparison result between data for the respective liquid crystal cell from a frame period previous to the one frame period and data for the respective liquid crystal cell from the one frame period.”

The Examiner cites Johnson as teaching “the modulated data signal has a voltage level larger than that of the data signal,” to allegedly cure the deficiencies in the teaching of Ueno. Applicant does not reach the Examiner’s conclusions regarding the teachings of Johnson. Applicant submits that Johnson does not cure the deficiencies in Ueno identified above, and that Ueno and Johnson, analyzed singly or in combination do not teach the combined features of recited in claim 21. Accordingly, Applicant submits that claim 21 is allowable over Ueno and Johnson.

With respect to the double patenting rejection of claims 1, 2, 6-8, 15-18, and 21 on the grounds of non-statutory obviousness type double patenting over claims 1-9 of U.S. Patent No. 6,788,280, Applicant disagrees with the Examiner’s assertions. Because the claims of the present application are not yet in their final form, Applicant believes that a Terminal Disclaimer would be premature at this time. After the remaining rejections have been resolved, Applicant will consider filing a Terminal Disclaimer in order to expedite prosecution of the instant application.

Applicant believes the above amendments and remarks place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps

necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37 C.F.R. § 1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. *A duplicate copy of this sheet is enclosed.*

Respectfully submitted,

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